WHAT IS CLAIMED IS:

1. An address management apparatus for managing a network layer address and a data link layer address of a terminal connected to a network, comprising:

data link layer address storage means for storing a data link layer address table showing the correspondences between data link layer addresses and network layer addresses;

data link layer address search means for searching the data link layer address table for an unused data link layer address;

corresponding network layer address search means for searching the data link layer address table for a network layer address corresponding to a specified data link layer address;

data link layer address assignment instruction means for transmitting a data link layer address assignment instruction which includes, as information, at least the unused data link layer address detected by the data link layer address search means, to a terminal specified by the network layer address detected by the corresponding network layer address search means;

data link layer address updation means for updating the correspondence between the data link layer address and the network layer address on the data link layer address table, according to the information of the data link layer address assignment instruction;

data link layer address assignment instruction detection means for detecting the data link layer address assignment

instruction to obtain the data link layer address from the instruction, in the terminal specified by the network layer address detected by the corresponding network layer address search means; and

data link layer address setting means for setting the data link layer address obtained by the data link layer address assignment instruction detection means, in the self terminal.

2.   The address management apparatus of Claim 1 further comprising:

network layer address storage means for storing a network layer address table showing the correspondences between network layer addresses and data link layer addresses;

network layer address search means for searching the network layer address table for an unused network layer address;

corresponding data link layer address search means for searching the network layer address table for a network layer address corresponding to a specified data link layer address;

network layer address assignment request detection means for detecting a network layer address assignment request including at least data link layer address information, which request is output from a terminal that needs to set a network layer address;

address assignment instruction means for transmitting a network layer address assignment instruction including, as information, the unused network layer address detected by the

network layer address search means, to the terminal which needs to set a network layer address, when there is no network layer address detected by the corresponding data link layer address search means;

network layer address updation means for updating the correspondence between the network layer address and the data link layer address on the network layer address table, according to the network layer address assignment instruction or the data link layer address assignment instruction;

said data link layer address updation means for updating the correspondence between the data link layer address and the network layer address on the data link layer address table, according to the network layer address assignment instruction or the data link layer address assignment instruction;

network layer address assignment request means for transmitting the network layer address assignment request in the terminal which needs to set a network layer address;

network layer address assignment instruction detection means for detecting the network layer address assignment instruction, and extracting the network layer address from the instruction; and

network layer address setting means for setting the network layer address extracted by the network layer address assignment instruction detection means, in the self terminal;

wherein said corresponding network layer address search means

searches the data link layer address table for a network layer address corresponding to the data link layer address in the network layer address assignment request information; and

when the network layer address searched by the corresponding network layer address search means exists in the data link layer address table, said data link layer address assignment instruction means transmits a data link layer address assignment instruction including, as information, at least the unused data link layer address detected by the data link layer address search means, to the terminal having the network layer address.

3.   The address management apparatus of Claim 2 further comprising:

network layer address assignment request delay means for detecting, in the self terminal, a network layer address assignment request directed to another terminal,

extracting a source data link layer address in the information of the detected network layer address assignment request, and

delaying transmission of a network layer address assignment request from the self terminal when the extracted data link layer address is equal to the data link layer address of the self terminal.

4.   The address management apparatus of Claim 1 further

comprising:

address detection means for detecting the correspondence between a data link layer address and a network layer address of a source of a transmission packet on the connected network, and the correspondence between a data link layer address and a network layer address of a destination of the transmission packet;

wherein said data link layer address updation means updates the correspondence between the data link layer address and the network layer address on the data link layer address table, according to the correspondence between the data link layer address and the network layer address of the source, and the correspondence between the data link layer address and the network layer address of the destination, which are detected by the address detection means; and

said network layer address table updation means updates the correspondence between the data link layer address and the network layer address on the network layer address table, according to the correspondence between the data link layer address and the network layer address of the source, and the correspondence between the data link layer address and the network layer address of the destination, which are detected by the address detection means.

5.   The address management apparatus of Claim 2 further

comprising:

address detection means for detecting the correspondence between a data link layer address and a network layer address of a source of a transmission packet on the connected network, and the correspondence between a data link layer address and a network layer address of a destination of the transmission packet;

wherein said data link layer address updation means updates the correspondence between the data link layer address and the network layer address on the data link layer address table, according to the correspondence between the data link layer address and the network layer address of the source, and the correspondence between the data link layer address and the network layer address of the destination, which are detected by the address detection means; and

said network layer address table updation means updates the correspondence between the data link layer address and the network layer address on the network layer address table, according to the correspondence between the data link layer address and the network layer address of the source, and the correspondence between the data link layer address and the network layer address of the destination, which are detected by the address detection means.

6. An address management method for managing a network layer

address and a data link layer address of a terminal connected to a network, comprising:

data link layer address storage step of storing a data link layer address table showing the correspondences between data link layer addresses and network layer addresses;

data link layer address search step of searching the data link layer address table for an unused data link layer address;

corresponding network layer address search step of searching the data link layer address table for a network layer address corresponding to a specified data link layer address;

data link layer address assignment instruction step of transmitting a data link layer address assignment instruction which includes, as information, at least the unused data link layer address detected in the data link layer address search step, to a terminal specified by the network layer address detected in the corresponding network layer address search step;

data link layer address updation step of updating the correspondence between the data link layer address and the network layer address on the data link layer address table, according to the information of the data link layer address assignment instruction;

data link layer address assignment instruction detection step of detecting the data link layer address assignment instruction to obtain the data link layer address from the instruction, in the terminal specified by the network layer address detected in

the corresponding network layer address search step; and

data link layer address setting step of setting the data link layer address obtained in the data link layer address assignment instruction detection step, in the self terminal.

7. The address management method of Claim 6 further comprising:

network layer address storage step of storing a network layer address table showing the correspondences between network layer addresses and data link layer addresses;

network layer address search step of searching the network layer address table for an unused network layer address;

corresponding data link layer address search step of searching the network layer address table for a network layer address corresponding to a specified data link layer address;

network layer address assignment request detection step of detecting a network layer address assignment request including at least data link layer address information, which is transmitted by a terminal that needs to set a network layer address;

address assignment instruction step of transmitting a network layer address assignment instruction including, as information, the unused network layer address detected in the network layer address search step, to the terminal which needs to set a network layer address, when no network layer address is detected in the corresponding data link layer address search step;

network layer address updation step of updating the

correspondence between the network layer address and the data
link layer address on the network layer address table, according
to the network layer address assignment instruction or the data
link layer address assignment instruction;

said data link layer address updation step of updating the
correspondence between the data link layer address and the
network layer address on the data link layer address table,
according to the network layer address assignment instruction or
the data link layer address assignment instruction;

network layer address assignment request step of transmitting
the network layer address assignment request in the terminal
which needs to set a network layer address;

network layer address assignment instruction detection step
of detecting the network layer address assignment instruction,
and extracting the network layer address from the instruction;
and

network layer address setting step of setting the network
layer address extracted in the network layer address assignment
instruction detection step, in the self terminal;

wherein, in said corresponding network layer address search
step, the data link layer address table is searched for a network
layer address corresponding to the data link layer address in the
network layer address assignment request information; and

when the network layer address searched by in corresponding
network layer address search step exists in the data link layer

address table, in said data link layer address assignment
instruction step, a data link layer address assignment
instruction including, as information, at least the unused data
link layer detected in the data link layer address search step,
is transmitted to the terminal having the network layer address.

8.   The address management method of Claim 7 further comprising:
     network layer address assignment request delay step of
detecting, in the self terminal, a network layer address
assignment request directed to another terminal,
     extracting a source data link layer address in the
information of the detected network layer address assignment
request, and
     delaying transmission of a network layer address assignment
request from the self terminal when the extracted data link layer
address is equal to the data link layer address of the self
terminal.

9.   The address management method of Claim 6 further comprising:
     address detection step of detecting the correspondence
between a data link layer address and a network layer address of
a source of a transmission packet on the connected network, and
the correspondence between a data link layer address and a
network layer address of a destination of the transmission
packet;

wherein, in said data link layer address updation step, the correspondence between the data link layer address and the network layer address on the data link layer address table is updated according to the correspondence between the data link layer address and the network layer address of the source, and the correspondence between the data link layer address and the network layer address of the destination, which are detected in the address detection step; and

in said network layer address table updation step, the correspondence between the data link layer address and the network layer address on the network layer address table is updated according to the correspondence between the data link layer address and the network layer address of the source, and the correspondence between the data link layer address and the network layer address of the destination, which are detected in the address detection step.

10. The address management method of Claim 7 further comprising:
address detection step of detecting the correspondence between a data link layer address and a network layer address of a source of a transmission packet on the connected network, and the correspondence between a data link layer address and a network layer address of a destination of the transmission packet;
wherein, in said data link layer address updation step, the

correspondence between the data link layer address and the network layer address on the data link layer address table is updated according to the correspondence between the data link layer address and the network layer address of the source, and the correspondence between the data link layer address and the network layer address of the destination, which are detected in the address detection step; and

in said network layer address table updation step, the correspondence between the data link layer address and the network layer address on the network layer address table is updated according to the correspondence between the data link layer address and the network layer address of the source, and the correspondence between the data link layer address and the network layer address of the destination, which are detected in the address detection step.